

## **REMARKS**

Applicant appreciates the thorough review of the present application as reflected in the Official Action mailed March 15, 2005. Applicant has amended Claims 1, 8 and 15 to further distinguish the cited references. Applicant submits that the application is now in condition for allowance, which action is respectfully requested.

### **Status of Claims**

Claims 1-8 and 10-20 are pending in the application. Claims 1-5, 11-16 and 20 stand rejected under 35 USC § 102(a) as anticipated by U.S. Patent No. 6,534,857 to Morse (hereinafter "Morse"). Claims 6-8, 10, and 17-19 stand rejected under 35 USC 103(a) as being unpatentable over U.S. Patent Publication No. 2002/0093033 to Zommer, et al. (hereinafter "Zommer") in view of Morse.

### **The Claims Are Not Anticipated by Morse**

Claim 1 has been amended to recite that the predetermined pattern of non-uniform pitch between the gate fingers provides a lower peak junction temperature during RF operation than a corresponding uniform gate pitch device for a particular set of operating conditions. Claim 15 has been amended to recite that the non-uniform spacing between the gates is provided in a pattern that provides a lower peak junction temperature during RF operation than a corresponding uniform gate pitch device for a particular set of operating conditions.

In contrast Morse does not mention junction temperature. Rather, Morse appears to be concerned with temperature in the semiconductor chip. See, e.g., Morse, Claims 10 and 16. In addition, the disclosure of Morse appears to be directed to power semiconductor devices. See, e.g., Morse, TITLE, and SUMMARY, col. 2, ll. 7-10. Morse does not mention RF operation. Accordingly, Morse does not disclose or suggest a semiconductor device comprising a plurality of unit cells connected in parallel, wherein a pitch between the gate fingers is varied in a predetermined pattern between the gate fingers so as to provide a non-uniform pitch between the gate fingers, wherein the predetermined pattern of non-uniform pitch

between the gate fingers provides a lower peak junction temperature during RF operation than a corresponding uniform gate pitch device for a particular set of operating conditions, as recited in Claim 1. Likewise, Morse does not disclose or suggest a field effect transistor comprising a plurality of unit cells electrically connected in parallel, each unit cell having a source region and a drain region; and a plurality of gates of the unit cells, the plurality of gates being electrically connected in parallel and having a non-uniform spacing between the gates, wherein the non-uniform spacing between the gates is provided in a pattern that provides a lower peak junction temperature during RF operation than a corresponding uniform gate pitch device for a particular set of operating conditions, as recited in Claim 15. Applicant submits that the dependent claims are allowable at least as depending from an allowable base claim. Thus, Claims 1-5, 11-16 and 20 are not anticipated by Morse.

**The Claims are Patentable Over Zommer In View of Morse**

In rejecting Claims 6-8, 10 and 17-19, the Official Action states that Zommer shows that for a two dimensional array of cells hot spots can occur which affect device performance and teaches to vary the cell characteristics in a predetermined way. Official Action, p. 3. The official Action further states that Zommer "shows that the variation can include gate pitch (paragraph [0045])." Id. Applicant respectfully submits that the cited passage of Zommer fails to show that variations in chip characteristics can include gate pitch. Rather, the cited passage of Zommer appears to state that gate width may be varied. Variation in gate width does not refer to cell-to-cell spacing. As is well known in the art, the dimension of gate width is orthogonal to the cell-to-cell dimension by which gate pitch is determined. Thus, a change in gate width does not affect the gate pitch. Accordingly, Zommer fails to disclose or suggest the recitations of Claims 6-8, 10, and 17-19. Thus, Applicant submits that Claims 6-8, 10 and 17-19 are patentable over the cited references for at least these additional reasons.

**Many of the Dependent Claims are Separately Patentable**

Applicant submits that the dependent claims are patentable at least as depending from patentable base claims. Applicant further submits that many of the dependent claims are separately patentable. For example, the cited references do not disclose or suggest a structure in which the spacing between the gates varies in a substantially linear pattern from a small pitch to a larger pitch toward the center of the device as recited in claims 10 and 29.

Morse discloses a high power transistor structure comprised of a plurality of field effect transistors fabricated in parallel on a common semiconductor chip and wherein the gate electrodes of the field effect devices are in the form of parallel finger elements having a variable pitch between the fingers which decreases, such as uniformly or non-uniformly, from a central portion of the cell to opposite outer end portions thereof. See Morse, SUMMARY, col. 2, ll. 14-22. That is, Morse makes reference to a transistor having a "uniform ... variation of pitch." Morse, col. 4, ll. 28-35. However, the only example given by Morse is of a transistor having a "non-uniform distribution." Id.

Claims 10 and 29 of the present application recite the spacing between the gates varies in a substantially linear pattern from a small pitch to a larger pitch toward the center of the device. Applicant submits that such a distribution does not constitute a "uniform variation of pitch" as disclosed by Morse. While Morse does not provide a specific example of a device with a "uniform variation of pitch", Applicant understands such language to mean that the variation of pitch (i.e. the decrease in pitch from cell to cell moving outward from the center of the device) is uniform, i.e. the same. Since the distance of a given gate finger from the center of the device is dependent not only on the gate pitch of the cell in question, but also on the cumulative gate pitches of all cells from the center of the device to the cell in question, such a uniform variation of pitch from cell to cell would result in a device having a highly non-linear variation of pitch as a function of distance from the center of the device. Stated differently, a uniform decrease in gate pitch from cell to cell implies that the

gate pitch reduction of a given cell over that of the previous cell would represent an increasingly large percentage of the gate pitch of the previous cell.

Moreover, in the example of Morse relating to a non-uniform variation of pitch, the number of fingers having a particular gate pitch decreases from 10 to 8 to 3 as the gate pitch decreases. Thus, the gate pitch of Morse appears to decrease in a nonlinear fashion as a function of distance from the center of the device.

Accordingly, Morse does not disclose or suggest that the pitch between the gate fingers varies in a substantially linear pattern from a small pitch to a larger pitch toward the center of the device. Accordingly, Applicant submits that Claims 10 and 29 are separately patentable over Morse for at least these additional reasons.

#### **Claim Rejection Under 35 USC § 112**

Claim 8 stands rejected under 35 USC § 112 as failing to comply with the enablement requirement. Applicant has amended Claim 8 to recite that the pitch between the gate fingers varies in a substantially linear pattern from a small pitch to a larger pitch toward the center of the device. Thus, Applicant has amended Claim 8 such that it no longer recites that the pitch between adjacent gate fingers is strictly inversely proportional. Support for this amendment may be found, for example, in the passage at page 7, lines 11-18 of the specification, which reads as follows:

As is further seen in **FIG. 1**, the gate fingers **24A**, **24B** and **24C** are non-uniformly spaced. In particular, the gate fingers **24A**, **24B** and **24C** are spaced apart in a predefined manner rather than merely being spaced differing distances as a result of variation in manufacturing. The predefined pattern may provide a lower peak junction temperature in the device that includes the gate fingers **24A**, **24B** and **24C**. The predefined pattern may be determined, for example, experimentally using thermal modeling of a device and/or through trial and error. The predefined pattern may be a linear or non-linear variation in spacing. (emphasis added)

In addition, the specification states at page 8, lines 27-28 as follows:

As is seen in **FIG. 2**, the pitch between the gate fingers 24 varies from a small pitch to a larger pitch toward the center of the device. (emphasis added)

Therefore, the rejection of Claim 8 under 35 USC § 112 should be withdrawn.

**Election/Restriction Requirement**

The Official Action required restriction of the application to the claims of Group I (Claims 1-8, 10-20) or Group II (Claims 21-27). Applicant hereby confirms the election of Group I, Claims 1-8, 10-20, without traverse, as referenced in the Official Action of March 15, 2005. Applicant has elected to prosecute the claims of Group I without traverse because Applicant agrees that the unpatentability of the claims of Group I would not necessarily imply the unpatentability of the claims of Group II, and vice versa. Accordingly, Applicant has cancelled claims 21-27 without prejudice to the filing of a divisional application to prosecute such claims.

**Conclusion**

Having addressed each of the issues raised in the Official Action, Applicant submits that the present application is in condition for allowance, which action is respectfully requested.

It is not believed that an extension of time and/or additional fee(s), including fees for net addition of claims, are required, beyond those that may otherwise be provided for in documents accompanying this paper. In the event, however, that an extension of time is necessary to allow consideration of this paper, such an extension is hereby petitioned under 37 C.F.R. §1.136(a). Any additional fees believed to be due in connection with this paper may be charged to Deposit Account No. 50-0220.

In re: Ronald C. Meadows  
Serial No.: 10/734,398  
Filed: December 12, 2003  
Page 11

Respectfully submitted,



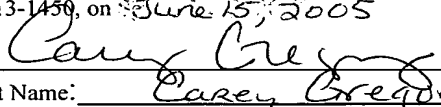
David C. Hall  
Registration No. 38,904

**USPTO Customer No. 20792**  
Myers Bigel Sibley & Sajovec  
Post Office Box 37428  
Raleigh, North Carolina 27627  
Telephone: 919/854-1400  
Facsimile: 919/854-1401

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on ~~June 15, 2005~~

Print Name: \_\_\_\_\_

  
Carey Gregory